

REMARKS

In this Amendment, Applicants amend claim 1 to more appropriately define the present invention, amend claims 22 – 26 to change their dependencies, and add new claim 30 to protect additional aspects related to the present invention. Upon entry of this Amendment, claims 1 – 14, 16, 18, and 20 – 30 remain pending and under current examination.

Regarding the Office Action:

In the Office Action, the Examiner responded to Applicants' arguments in the Amendment filed with the RCE; rejected claims 22 – 26 under 35 U.S.C. § 112, 2nd paragraph; repeated the rejection of claims 1 – 4, 7 – 11, 14, and 20 under 35 U.S.C. § 102(b) as anticipated by Livesay, et al. (PCT Int'l Publication No. WO 96/36070) ("Livesay-1"); repeated the rejection of claims 6 and 13 under 35 U.S.C. § 103(a) as unpatentable over Livesay-1 in view of Livesay, et al. (U.S. Patent No. 5,003,178) ("Livesay-2"); rejected claims 16, 18, and 27 – 29 under 35 U.S.C. § 103(a) as unpatentable over Livesay-1 in view of Goo, et al. (U.S. Patent No. 5,989,983); and objected to claims 5, 12, and 21 as being dependent upon a rejected base claim, but indicated that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants appreciate the Examiner's thorough examination of this application, especially the detailed citations which aided Applicants in reviewing the Examiner's comments. Applicants also appreciate the Examiner's indication of the allowability of the subject matter in claims 5, 12, and 21.

Applicants also thank the Examiner for her time and courtesy in granting telephone interviews with Applicants' representative on September 12, 2003 and September 16, 2003.

Further to those discussions, Applicants respond to the Office Action, as follows:

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Regarding the Amendments to Claims 1 and 22 – 26:

Applicants amend claim 1 to more appropriately define the present invention. Support for the Amendment may be found, among other places, in Applicants' specification on p. 16, line 26 to page 18, line 17. Applicants also amend claims 22 – 26 to change the claim dependency, thereby obviating the 35 U.S.C. § 112, 2nd paragraph, rejection discussed in the next section.

Applicants submit that the amendments contain no new matter, in accordance with the requirements of 37 C.F.R. § 1.121(f) and the references to the disclosure that follow.

Regarding the Rejection of Claims 22 – 26 under 35 U.S.C. § 112, 2nd paragraph:

Regarding the rejection of claims 22 – 26 under 35 U.S.C. § 112, 2nd paragraph, Applicants have amended claims 22 – 26 to change the claim dependency from "20" to "21," thereby providing sufficient antecedent basis for "at least one of the pre-heat treatment and the post-heat treatment." *See* Office Action, page 4. Applicants submit that these amendments overcome the Examiner's 35 U.S.C. § 112, 2nd paragraph, rejection.

Applicants therefore deem the rejection of claims 22 – 26 overcome. The pending claims fully comply with the requirements of 35 U.S.C. § 112, 2nd paragraph, and Applicants respectfully request withdrawal of the rejection.

Regarding the Rejection of Claims 1 – 4, 7 – 11, 14, and 20 under 35 U.S.C. § 102(b):

Applicants respectfully traverse the rejection of claims 1 – 4, 7 – 11, and 14, and 20 under 35 U.S.C. § 102(b) as anticipated by *Livesay-1*. (During the September 12, 2003 interview, the Examiner noted that claim 20 was included in this rejection even though it did not appear in the opening paragraph of the Office Action.)

In order to properly establish that *Livesay-1* anticipates Applicants' claimed invention under 35 U.S.C. § 102, each and every element of each of the claims in issue must be found,

either expressly described or under principles of inherency, in that single reference.

Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” See M.P.E.P. § 2131, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Regarding the 35 U.S.C. § 102(b) rejection, Livesay-1 does not teach each and every element of Applicants’ present invention as claimed.

Livesay-1 discloses a method of forming and curing a spin-on-glass film having no cracks. Livesay-1, page 9, lines 17 – 19 teach that the wafer is simultaneously heated by the infrared lamps and the electron beam throughout the entire process. Furthermore, page 9, lines 19 – 23 teach that the infrared lamps are on continuously until the wafer temperature reaches 200-250°C, and that the lamps are turned off and on at a varying duty cycle to control the wafer temperature. Livesay-1 teaches that when an electron beam irradiates the wafer, the lamps keep the wafer temperature between 200-250°C, which is at a constant level throughout the entire process.

This is in contrast to Applicants’ independent claim 1, which includes two separate heating temperatures having different parameters, recited as follows:

“curing the insulation film raw material by irradiating an electron beam on the substrate *while heating the substrate at a first heating temperature and holding the first heating temperature constant* in a reactor chamber, and causing to change temperature of the substrate from the first heating temperature to a second heating temperature different from the first heating temperature *and holding the second heating temperature constant* during the electron beam irradiating process, *wherein the second heating temperature is lower than the first heating temperature*” (claim 1, italics added).

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As discussed in the September 12, 2003 interview, this is also in contrast to Applicants' independent claim 20, which in part recites: "*changing* at least one of the parameters selected from the group consisting of pressure in the reactor chamber, type of gas having the substrate exposed thereto, flow rate of a gas introduced into the reactor chamber, position of the substrate, and *quantity of electrons incident to the substrate per unit time when the electron beam is being irradiated on the substrate*" (claim 20, italics added). Livesay-1, page 9, lines 19 – 24, describe irradiating with an electron beam, but do not teach or suggest changing the quantity of electrons incident to the substrate per unit time.

Therefore, Livesay-1 fails to disclose at least the above-quoted elements of Applicants' independent claims 1 and 20, and is different from the present invention for the reasons just presented.

Therefore, since Livesay-1 does not disclose each and every element of Applicants' independent claims 1 and 20, Livesay-1 does not anticipate Applicants' claimed invention and does not disclose an identical invention in as complete detail as contained in Applicants' independent claims 1 and 20. Applicants therefore submit that independent claims 1 and 20 are allowable, for the reasons argued above. In addition, Applicants submit that dependent claims 2 – 4, 7 – 11, and 14 are also allowable at least by virtue of their respective dependence from allowable base claims 1 and 20. Applicants respectfully request that the Examiner withdraw the 35 U.S.C. § 102(b) rejection.

Regarding the Rejection of Claims 6 and 13 under 35 U.S.C. § 103(a):

Applicants respectfully traverse the rejection of claims 6 and 13 under 35 U.S.C. § 103(a) as unpatentable over Livesay-1 in view of Livesay-2, and submit that a *prima facie* case of obviousness has not been established.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143.

Livesay-2, taken alone or in combination with Livesay-1, still does not teach or suggest those recitations of Applicants' independent claims 1 and 20 not taught or suggested by Livesay-1. According to the Examiner, Livesay-2 was cited for teaching "in figure 3 adjusting the position of the substrate (30) in a range from not less than 50 mm to not more than 120 mm in distance from an electron beam generating section" (Office Action, page 9). Livesay-2 does not cure the deficiencies of Livesay-1 that were pointed out in the previous section in that it still does not teach or suggest at least the elements of Applicants' independent claims 1 and 20 not taught or suggested by Livesay-1. Since Applicants have already demonstrated above that Livesay-1 does not teach or suggest all the recitations of Applicants' independent claims 1 or 20, therefore, for at least the reasons stated above, Applicants' claims 6 and 13 are not obvious.

The Examiner has therefore not met at least one of the essential criteria for establishing a *prima facie* case of obviousness, wherein "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *See* M.P.E.P. §§ 2142, 2143, and 2143.03.

Applicants further submit that, according to the M.P.E.P., the Examiner's citation of Livesay-1 in view of Livesay-2 is not sufficient to establish *prima facie* obviousness.

Finally, "[i]f an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious." M.P.E.P. § 2143.03. Thus, dependent claims 6 and 13 are

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allowable for the reasons presented herein, in addition to being allowable at least by virtue of their respective dependence from allowable base claims 1 and 20. Therefore, Applicants respectfully submit that the Examiner should withdraw the 35 U.S.C. § 103(a) rejection.

Regarding the Rejection of Claims 16, 18, and 27 – 29 under 35 U.S.C. § 103(a):

Applicants respectfully traverse the rejection of claims 16, 18, and 27 – 29 under 35 U.S.C. § 103(a) as unpatentable over Livesay-1 in view of Goo, respectfully submit that a *prima facie* case of obviousness has not been established. (During the September 12, 2003 interview, the Examiner noted that claim 29 was included in this rejection even though it did not appear in the opening paragraph of the rejection.)

The requirements for the Examiner to establish a *prima facie* case of obviousness were set forth in the previous section. Furthermore, Applicants note dependent claims 16, 18, and 27 – 29 are directed to a combination including everything recited in the base claim and what is recited in the dependent claim. *See* M.P.E.P. § 608.01(n)(III), p. 600-77.

Goo, taken alone or in combination with Livesay-1, still does not teach or suggest those recitations of Applicants' independent claims 1 and 20 not taught or suggested by Livesay-1. Even though the Examiner cited Goo to assert that "in figures 1A and 1b applying Spin-On-Glass (SOG) (ref. 13) and curing this layer with e-beam..." (Office Action, p. 10), Goo still does not cure the deficiencies of Livesay-1 in that it still does not teach or suggest at least the elements of Applicants' independent claims 1 and 20 not taught or suggested by Livesay-1.

Applicants have already demonstrated above that Livesay-1 does not teach or suggest all the recitations of Applicants' independent claims 1 or 20, and therefore, for at least the reasons stated above, Applicants' dependent claims 16, 18, and 27 – 29 are not obvious.

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The Examiner has therefore not met at least one of the essential criteria for establishing a *prima facie* case of obviousness. Thus, dependent claims 16, 18, and 27 – 29 are allowable for the reasons presented herein, in addition to being allowable at least by virtue of their respective dependence from allowable base claims 1 and 20. Therefore, Applicants respectfully submit that the Examiner should withdraw the 35 U.S.C. § 103(a) rejection.

Regarding the Objection to Claims 5, 12, and 21:

Further to the discussion in the September 12, 2003 interview, Applicants submit that claims 5, 12, and 21 are also allowable at least by virtue of their respective dependence from allowable base claims 1 and 20.

Regarding New Claim 30:

Finally, Applicants have introduced new claim 30 to provide coverage for other aspects of Applicants' invention. Applicants submit that the new claim is supported by the originally filed application, including, among other places, similar elements of Applicants' allowable claim 1.

Conclusion:

In making various references to the specification and drawings set forth herein, it is understood that Applicants are in no way intending to limit the scope of the claims to the exemplary embodiments described in the specification and illustrated in the drawings. Rather, Applicants expressly affirm that they are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

In view of the foregoing, and with respect to the agreement reached during the September 12, 2003 interview, Applicants request reconsideration of the application and submit that the

objection and rejections detailed above should be withdrawn. Applicants submit that pending claims 1 – 14, 16, 18, and 20 – 30 are in condition for allowance, and request a favorable action.

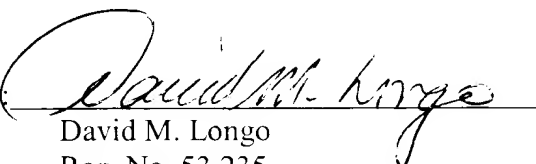
Should the Examiner continue to dispute the patentability of the claims after consideration of this Amendment, Applicants encourage the Examiner to contact Applicants' undersigned representative by telephone to discuss any remaining issues or to resolve any misunderstandings. Applicants' undersigned representative would welcome the opportunity to discuss the merits of the present invention with the Examiner if telephone communication will aid in advancing prosecution of the present application.

Please grant any extensions of time under 37 C.F.R. § 1.136 required in entering this response. If there are any fees due under 37 C.F.R. § 1.16 or 1.17 including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our deposit account 06-0916.

Respectfully submitted,

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